

Children's Perceptions of Vulnerability to Illness and Accidents

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THE LIKELIHOOD of taking some preventive or adaptive health action is related in large measure to whether a person perceives himself as being vulnerable to an illness or accident (1). However, few researchers have explored this particularly important psychological correlate of the effectiveness of public health programming.

The exploratory research reported here, which I conducted in 1967-68, is one of a series of investigations of the development of such perceptions of vulnerability in children. The focal point of this report is the dimension of consistency in expectancies of health problems—the manner in which the degree of expectancy of one health problem is related to the degree of expectancy of other such problems. Two major aspects of consistency are discussed: (a) the degree of consistency of these expectancies within the individual child and (b) the degree of consistency in patterns of expectancies among groups of children.

The ultimate practical goal of this research is the establishment of a sounder basis than is now available for planning health education programs that will have optimal effectiveness in terms of content and timing. For example, the results of this study suggest that programs aimed at children under 10 years of age might

be more meaningful if they deal with specific illnesses or diseases rather than with some abstract concept of general good health. And, health educators might find it more worthwhile in the future to focus less on imparting health knowledge and more on modifying people's perceptions of vulnerability to health problems.

Subjects and Method

A sample of 134 youngsters in Ann Arbor, Mich., 75 Boy Scouts and 59 Girl Scouts, volunteered to participate in the study. Their ages ranged from 7 to 17 years. The girls and younger boys were white and from middle-class homes whereas the group of older boys consisted of both whites and Negroes and were, perhaps, from lower class as well as middle-class homes. No data were obtained that would permit social-class identification of individual children and, consequently, no social-class analyses were performed. However, since I was more concerned with exploring phenomena than with the sample's universality the subjects were selected more for convenience than for representativeness of a larger population.

Health problem expectancies were assessed through responses to a series of 10 questions such as: "How likely are you to catch a cold during this next year?" The expectancies dealt with remaining healthy, a bad accident, a rash, fever, sore throat, flu, a toothache, a cold, missing a week of school because of sickness, and upset stomach. These health-relevant questions were interspersed with 15 other items relating to other aspects of the youngsters' lives; for example, "How likely are you to be invited to a friend's party during this next year?"

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For each item, a youngster was instructed to select one response from among seven alternatives that best expressed his expectancy—no chance, very unlikely, somewhat unlikely, as likely as not, somewhat likely, very likely, or certain.

The items and the response alternatives were selected so that they would be appropriate for the entire age range of the sample, and the instructions were designed to insure that even the youngest subjects understood the task. My assistant and I were satisfied that the youngsters understood the instructions well enough to answer the questions appropriately.

The responses were scored from 1 for the "no chance" alternative to a maximum of 7 for a response of "certain."

The questionnaire was administered at regularly scheduled Scout meetings, following a brief introduction by the leader in charge. The potential subjects were assured of confidentiality and anonymity, and were permitted to decline to participate if they wished. For those who had difficulty in reading, we read each item aloud. The sessions generally lasted 30–45 minutes.

Results

Consistency within children's expectancies. Correlational analyses (2) were performed to determine the relationships between a child's answers to questions about one health problem and his answers to others. In 34 of a total of 45 possible pairs of expectancies, the correlations were statistically significant. The graph is a simple illustration of the meaning of correlation in these instances.

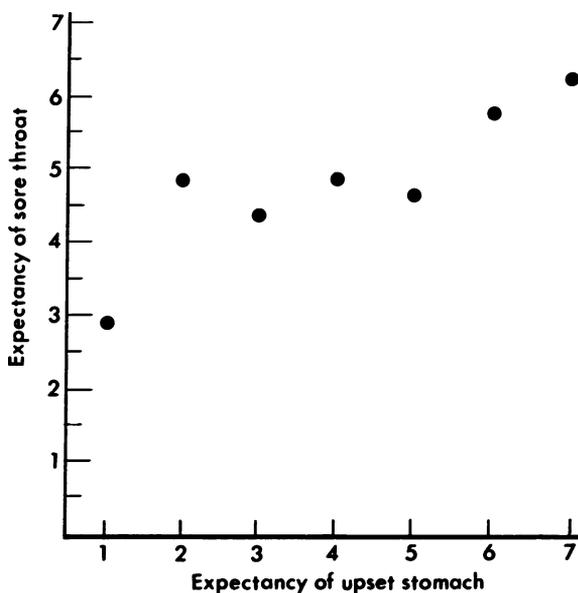
Interestingly, there were no consistent negative correlations between the expectancy of remaining healthy and the expectancies of specific health problems, that is, high expectancies of remaining healthy were not related to low expectancies of encountering specific health problems and vice-versa. Among these specific health problem expectancies 33 of 35 correlations were significant.

Separate analyses were carried out for children under 10 years old and those aged 10–16 (two 17-year-old assistant leaders were excluded from age-specific analyses). Generally, the same type of correlation was observed in the two age groups. Among younger children the absence of

negative correlations between the expectancy of remaining healthy and expectancies of specific health problems was far more pronounced. Among older children, however, this inconsistency disappeared, and the expectancy of remaining healthy was significantly and negatively related to expectancies of specific health problems. These differences suggest that the general concept of health may be too abstract for the younger child, while the specific health problems dealt with in the nine other questions (for example, colds and sore throats) are more concrete components of the younger child's experiences and are more assimilable into his "expectancy system." On the other hand, the concept of health is not too abstract for the older child to assimilate into his expectancy system in a consistent way. The correlations for boys and girls separately were also significant.

Of course, certain conditions such as sore throat, cold, flu, and fever are all naturally encountered in general upper respiratory tract infections, and the high correlations between the expectancies of these health problems might be

An illustration of correlation between expectancies of two health conditions: sore throat and upset stomach



NOTE: For each value of expectancy of an upset stomach, the mean value of the expectancies of sore throat have been plotted. A relationship, albeit not a perfect one, does exist.

Table 1. Median health-relevant expectancy scores, total sample of 134 children

Expectancy	Median	Rank
Accident.....	2.27	1
Missing school because of sickness..	2.48	2
Rash.....	3.00	3
Flu.....	3.72	4
Toothache.....	3.84	5
Fever.....	4.93	6
Remaining healthy.....	5.60	7
Sore throat.....	5.64	8
Upset stomach.....	5.76	9
Cold.....	6.00	10

NOTE: The expectancy scores themselves range from 1 (lowest) to 7 (highest); the medians are then ranked from 1 to 10.

accounted for primarily in terms of expectancy of upper respiratory illness. But there were also many significant correlations among expectancies of health problems that could not be accounted for in terms of a single syndrome— toothaches, upset stomachs, accidents, and rashes—as well as between these and the upper respiratory conditions.

It seems that the degree to which a child expects a particular illness or accident to occur is related to the degree to which he expects other such events to occur. This demonstration of individual consistency suggests that there may be a personality characteristic of perceived vulnerability to health problems.

Consistency in patterns of expectancies. The median expectancy scores within the entire sample for each health-related question are presented in table 1. The children perceived a bad accident as the least likely to occur among all the health-relevant events and catching cold as most likely to occur. The consistency of this pattern of expectancies was determined by correlation analyses (2). Table 2 shows the median expectancy scores for each question for youngsters under 10 years of age and those aged 10–16 and the ranks assigned to each median. The correlation coefficient for these two sets of rankings is .96, indicating extremely high agreement between the rankings of the two age groups (such coefficients can range only between –1.00 and 1.00). Table 3 presents the median expectancy scores for each question by sex; the correlation computed for these two sets of rankings was .88, again indicating marked agreement.

To determine whether the same pattern exists when age and sex are considered conjointly, the sample was divided further into four groups: boys under 10 years old, boys 10–16, girls under 10, and girls 10–16 (table 4). The correlation of agreement (2) was .89, indicating marked agreement among the four sets of rankings.

These analyses suggest that children have a rather well-articulated pattern, or hierarchy, of expectancies. In general, the degree of perceived expectancy for some given health problem in one age-sex group is highly related to its degree of perceived expectancy in other age-sex groups.

Table 2. Median expectancy scores and rankings, by age

Expectancy	Under 10 years (N=55)		10–16 years (N=77)	
	Median	Rank	Median	Rank
Accident.....	2.06	1	2.38	1
Missing school because of sickness....	2.14	2	3.06	3
Rash.....	3.33	3	2.94	2
Flu.....	3.64	4	3.83	5
Toothache.....	4.11	5	3.61	4
Fever.....	5.10	6	4.91	6
Remaining healthy....	5.77	8	5.53	7
Sore throat.....	5.68	7	5.64	8
Upset stomach.....	5.81	9	5.74	9
Cold.....	6.07	10	6.00	10

NOTE: The expectancy scores themselves range from 1 (lowest) to 7 (highest); the medians are then ranked from 1 to 10.

Table 3. Median expectancy scores and rankings, by sex

Expectancy	Boys (N=75)		Girls (N=59)	
	Median	Rank	Median	Rank
Accident.....	2.04	1	2.67	1
Missing school because of sickness	2.26	2	3.30	3
Rash.....	3.00	3	3.07	2
Flu.....	3.57	5	3.95	4
Toothache.....	3.50	4	4.08	5
Fever.....	4.83	6	5.04	6
Remaining healthy....	5.81	10	5.31	7
Sore throat.....	5.44	7	5.92	9
Upset stomach.....	5.79	8.5	5.74	8
Cold.....	5.79	8.5	6.35	10

NOTE: The expectancy scores themselves range from 1 (lowest) to 7 (highest); the medians are then ranked from 1 to 10.

Thus, health problems seen as relatively unlikely by younger girls are similarly perceived as relatively unlikely by younger boys, older boys, and older girls. The converse is also true. And neither age nor sex has an appreciable effect on this general pattern. At an early age, undetermined by this study, children begin to acquire a perceptual pattern of health problem expectancies that remains stable over time, at least through 16 years of age, and is apparently not contradicted by subsequent experience or growth.

Age and sex differences in levels of expectancies. No significant differences were seen in specific expectancies between younger and older children. There were, however, some interesting sex differences. Boys showed significantly lower expectancies than girls of sore throats and colds and significantly higher expectancies of remaining healthy; for nine out of 10 questions the differences were in this direction (table 3). These results point to some developmental precursors of established observations that adult women actually see themselves as being more susceptible to diseases such as cancer and tuberculosis than do men (3).

Implications for Health Personnel

Although it would be premature to generalize beyond the cross-sectional data obtained in this study, five points of interest to public health personnel should be considered.

First, if longitudinal research confirms the

stability of expectancies of health problems, then attempts to change levels of perceived vulnerability might have to begin far earlier than they now do. For example, rather than waiting until children are in high school, campaigns to discourage smoking or to teach other desirable health behavior might more effectively begin in the early primary grades with attempts to point out the specific health problems associated with smoking or with other undesired behavior.

Second, if further research confirms the consistency of health problem expectancies, health educators might well note that some high-risk groups contain disproportionate numbers of persons who see themselves as relatively invulnerable to a range of health problems. Psychologically, each person's "system" of expectancies may have a coherence of its own and particular components of it (specific health problem expectancies) may be notoriously resistant to change on an individual basis. Thus it may be necessary to devise some new educational techniques aimed at changing the person's total sense of vulnerability in order to change specific health problem expectancies.

A third point deals with the apparent inability of younger children to deal with "health" as an abstract concept. Further research may reveal that for children under age 10 a disease-oriented health education program might be most effective, even though public health professionals generally prefer to treat health as a concept above and beyond the absence of disease.

Table 4. Median expectancy scores and rankings, by age and sex conjointly

Expectancy	Boys				Girls			
	Under 10 (N=32)		10-16(N=41)		Under 10 (N=23)		10-16 (N=36)	
	Median	Rank	Median	Rank	Median	Rank	Median	Rank
Accident.....	2.00	1	2.12	1	2.50	3	2.78	1
Missing school because of sickness.....	2.14	2	2.50	3	2.25	2	3.56	3
Rash.....	3.57	3	2.75	4	3.00	4	3.20	2
Flu.....	3.86	4	3.50	5	2.17	1	4.09	4
Toothache.....	4.50	5	2.41	2	3.75	5	4.31	5
Fever.....	4.88	6	4.90	6	5.67	6	4.96	6
Remaining healthy.....	5.85	9	5.83	10	5.70	7	5.27	7
Sore throat.....	5.62	7	5.35	7	5.90	8.5	5.96	9
Upset stomach.....	5.81	8	5.79	9	5.90	8.5	5.72	8
Cold.....	5.95	10	5.75	8	6.50	10	6.34	10

NOTE: The expectancy scores themselves range from 1 (lowest) to 7 (highest); the medians are then ranked from 1 to 10.

Fourth, the observed consistency and stability notwithstanding, future longitudinal research may reveal that there are some developmental periods in which health problem expectancies are more likely to change than in others and in which educational programs will have maximum impact.

Finally, the observed absence of a marked general preventive orientation toward health problems in American adults (3) may well be attributed in part to relatively low perceived vulnerability to health problems.

At present, I am conducting research that expands the sampling of both health problems and populations to permit greater generalization. Questions include sinus trouble, headaches, accidental cuts, bee stings, and dental cavities in addition to the problems discussed here. Also, children are being drawn systematically from both white and nonwhite populations, from inner-city and non-inner-city schools. One investigation also will determine the effect of parental training and health history upon the development of a sense of vulnerability to health problems and the relationship between this sense of vulnerability and other aspects of personality. Furthermore, longitudinal studies will help in assessing the validity of the cross-sectional data reported here.

Summary

An exploratory study was undertaken in 1967-68 to examine children's perceptions of

vulnerability to illness and accidents and the degree of consistency in expectancies of such health-related events.

The responses of 134 youngsters, 10-17 years old, to 10 questions about the likelihood of encountering certain health-related events indicated that perceived vulnerability is consistent across health problems and may be evidence of a personality characteristic. Also, there was a consistent pattern of health-relevant expectancies that was not markedly affected by age or sex. However, some sex differences in levels (not consistency) of expectancy of illness were noted. Implications of these findings for public health workers relate to the content and timing of programs designed to teach desirable health behavior.

REFERENCES

- (1) Rosenstock, I. M.: Why people use health services. *Milbank Mem Fund Quart* 44: 94-127 (1966).
- (2) Siegel, S.: *Nonparametric statistics for the behavioral sciences*. McGraw-Hill, Inc., New York, 1956, ch. 9.
- (3) Kirscht, J. P., Haefner, D. P., Kegeles, S. S., and Rosenstock, I. M.: A national study of health beliefs. *J Health Human Behav* 7: 248-254 (1966).

Tearsheet Requests

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Contributed Papers on Medical Care for 1970 APHA Meetings, Houston

April 15, 1970, will be the deadline for authors to submit abstracts of papers for possible inclusion in the Medical Care Section Program of the next annual meeting of the American Public Health Association (October 26-30, 1970, at Houston, Tex.). Standard abstract forms may be obtained from:

Rosemary A. Stevens, Ph.D.
Assistant Professor of Public Health (Medical Care)
Yale School of Medicine
60 College Street
New Haven, Connecticut 06510

Two types of papers will be considered—research reports and descriptions of programs or demonstrations. Those whose papers are selected for the program will be notified in early June.

Program Notes

Dial for Information on Rubella

Residents of Baltimore and central Maryland can obtain information on rubella by telephone. In a recorded message, Dr. Howard J. Garber, chief of the division of communicable diseases, Maryland State Department of Health, gives the latest information on the disease and on plans underway in Maryland to use the rubella vaccine.

This informational device, called "Stork Line," is a service of the local chapter of the National Foundation-March of Dimes. State and local health departments and the Medical-Chirurgical Faculty of Maryland plan to immunize many school children during the fall of 1969 and the 1969-70 winter. The vaccine administered by the health department will be used primarily for children of both sexes from kindergarten through third grade.

Regulations for Kidney Centers

"A kidney center shall be a unit established within, or as part of, or affiliated with a hospital duly licensed by the State department of health," according to regulations adopted in August 1969 by the Washington State Board of Health.

The regulations also provide that "Generally, the kidney center shall provide all physical facilities, professional consultation, personal instruction, medical treatment and care, drugs, hemodialysis equipment, and supplies necessary for the carrying out of a medically sound kidney treatment program."

State funding is available to designated kidney centers when appropriate documented evidence is submitted to the health department.

Medical Emergency Technicians

Eighteen medical emergency technicians graduated in June 1969 with an associate degree in applied science after a 2-year course at Man-

hattan Community College in New York City. Clinical training was provided at the New York Polyclinic Medical School and Hospital. Besides qualifying as medical emergency technicians, these 18 men and women are eligible to take the professional nurse licensing examination. Upon graduation, each had a job waiting, according to Dr. Blanche R. Ried, division of health service technologies at the college.

Graduates of the program, which was inaugurated in 1967 with the aid of a Ford Foundation grant, will serve in ambulances, emergency rooms, intensive and coronary care units, infirmaries, first-aid stations, and other emergency situations. They are expected to become invaluable members of the lifesaving medical team.

First-year students study English composition, sociology, mathematics, anatomy and physiology, developmental psychology, general biology, physical education, fundamentals of nursing care, and medical emergency techniques.

The second-year curriculum includes general science, microbiology, speech, English literature, conversational Spanish, music or art, advanced fundamentals of nursing care, and emergency medical techniques.

The students' exposure to clinical practice starts in the first semester (see photograph) and is significantly increased over the 2-year period.—*Health News* (New York State Department of Health) August 1969.

Steak the Calorie Culprit?

When steaks or starches are the choice, teenage girls tend to overestimate the calories in starchy foods and to underestimate those in meat.

Dr. Jean Mayer and Dr. Johanna T. Dwyer, department of nutrition, Harvard School of Public Health, tested senior girls from two Massachusetts high schools on their knowledge of calories in food. The researchers were aided by a grant from the National Institute of Arthritis and Metabolic Diseases, Public Health Service.

When 446 of the girls were asked to estimate the calories in typical servings of meat and starchy foods, they guessed that the meat portions contained 252 calories instead of the actual 300 and that the starchy portions contained 210 instead of 150.

Next, 167 senior girls were shown 17 paired food samples, each consisting of a serving high in starch, such as potatoes or macaroni, and a serving of meat, such as hamburger or pork chop. Both dieters and non-dieters again thought that the starchy food portions were highest in calories. Actually each serving of starchy food contained up to 100 calories less than the paired meat serving.—*Journal of the American Dietetic Association*, April 1969.

